

From: Vaidya, Bhalchandra
Sent: Tuesday, March 30, 2021 7:23 AM
To: Taken, Jason C.:(Exelon Nuclear); Kusumawatimurray, Putri:(Exelon Nuclear)
Cc: Salgado, Nancy; Mitchell, Matthew
Subject: LaSalle Unit 2 - Verbal Authorization of LaSalle Unit 2 Request for an Alternative I4R-12, Revision 2 re: Valve Repairs on Valves 2B33-F060A and 2B33-F060B

Jason and Dwi,

By telephone conversation on March 29, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff provided a verbal authorization to Exelon Generation Company for the proposed Alternative I4R-12, Revision 2, for LaSalle County Station Unit No. 2 from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, "Rules for Construction of Nuclear Facility Components" and Section XI "Rules for Inservice Inspection of Nuclear Power Plant Components," related to the current refueling outage L2R18 repairs of Valves 2B33-F060A and 2B33-F060B.

The following NRC and licensee personnel participated in the conference call:

NRC

Bhalchandra K. Vaidya, Licensing Project Manager, Plant Licensing Branch III, Office of Nuclear Reactor Regulation
Nancy Salgado – Chief, Plant Licensing Branch III, Office of Nuclear Reactor Regulation
Matthew Mitchell – Chief, Piping and Head Penetrations Branch, Office of Nuclear Reactor Regulation

Exelon Generation Company

John Washko – Site Vice President
Deborah Mcbreen – Regulatory Assurance
Larry Lehman – Engineering
James Patterson – Engineering
Amy McMartin – Engineering
David Gullott – Licensing
Dwi Murray – Licensing
Jason Taken – Licensing
Kevin Hall – NDE
David Anthony - NDE
Jereme Greenblott – Regulatory Assistance

Please contact me if you have any questions.

Bhalchandra K. Vaidya
US Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
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VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FOR PROPOSED ALTERNATIVE NUMBER I4R-12, REVISION 2
ALTERNATIVE EXAMINATION REQUIREMENTS FOR
REPAIR OF REACTOR RECIRCULATION FLOW CONTROL VALVES
EXELON GENERATION COMPANY, LLC
LASALLE COUNTY STATION, UNIT 2
DOCKET NO. 50-374
March 29, 2021

**Technical Evaluation read by Matthew Mitchell, Chief of the Piping and Head Penetrations Branch,
Office of Nuclear Reactor Regulation**

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 26, 2021, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21085A000), as supplemented by letter dated March 26, 2021, (ADAMS Accession No. ML21085A874) Exelon Generation Company, LLC (the licensee) proposed an alternative to certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, "Rules for Construction of Nuclear Facility Components" and Section XI "Rules for Inservice Inspection of Nuclear Power Plant Components," related to the repair of degraded Reactor Recirculation Flow Control Valves 2B33-F060A (the "A" Valve) and 2B33-F060B (the "B" Valve) at LaSalle County Station, Unit 2 (LaSalle Unit 2). The licensee submitted proposed alternative I4R-12, Revision 2 for the use of Enhanced Visual Testing (EVT) examination requirements in lieu of the ASME Code-required Penetrant Testing (PT) and Radiographic Examination (RT) for the repairs.

The licensee requested authorization for this alternative in accordance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(z)(2) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

During refueling outage L2R18 in February 2021, inspections of the "A" and "B" Valves discovered damage to each valve's internals and lower body. The unusual wear of the valve bodies is believed to have occurred as the result of an atypical low-power operating condition that occurred in 2015. The licensee will conduct repairs to restore the valves to an acceptable condition. These repairs will consist of machining and grinding the inside surface of the valves and building up the inner surface with weld metal to restore the minimal wall thicknesses of the valves, installing the new valve internals, and welding an anti-rotation device into place. As repaired, the mechanical functioning of the valves will be unchanged, and all ASME Code requirements other than those addressed by the licensee's requested alternative will continue to be met. While the wear on the inside surface of the valves did not go below the minimum wall thicknesses of 2.418 inches, the surface conditioning of the valves will reduce the total thickness to below the minimum by an estimated 0.135 inches and 0.095 inches for the "A" and "B" Valves, respectively. The weld buildup on these valves will be on the inner surface and will be pressure-retaining in that it will restore the valves to over their minimum wall thickness required for

structural integrity. The valve internals will be replaced using a 316 stainless steel Stellite-overlaid lower plug guide with as 304L stainless steel anti-rotation device welded into place. The Stellite will not be in contact with the repaired area to reduce wear of the repaired surfaces.

The weld repairs must meet the requirements of ASME Code, Section XI, IWA-4411, "Welding, Brazing, Fabrication, and Installation," which require that the welds be performed in accordance with the construction code. ASME Code, Section III, NB-2570, "Repair of Statically and Centrifugally Cast Products," requires that the internal surface be examined using magnetic particle testing (MT) or PT after machining. ASME Code, Section III, NB-2578, "Elimination of Defects," requires the use of NB-2538, "Elimination of Surface Defects," which requires the use of PT to assure that the defect has been removed or reduced to an acceptable size. ASME Code, Section III, NB-2539.4, "Examination of Repair Welds," requires either a PT or MT examination. Additionally, ASME Code, Section III, NB-2539.4 requires an RT on repair welds over 3/8 of an inch or 10 percent of the section thickness. The applicable codes and addenda for LaSalle Unit 2 are the 1971 Edition, Summer through 1972 Addenda for Section III and the 2007 Edition, through 2008 Addenda for Section XI.

The licensee is proposing to use EVT in lieu of PT for the various stages of the repair for both the pressure-retaining weld buildup on the valve body as well as for the installation of a fillet weld to fix the anti-rotation device in place. EVT is an examination technique that uses remote camera equipment to perform visual inspections of components. EVT has been evaluated by the NRC and industry and is similar in its capabilities to a VT-1 examination as described in ASME Code, Section XI. EVT is not considered to be equivalent to PT, as EVT is more sensitive to issues such as lighting angle, viewing angle, and surface scratches, any of which can hide small cracks. The use of EVT as opposed to PT could result in small cracks being left in the welds.

The licensee is also proposing to not perform the RT examination. Performing the RT of the final repair would detect possible subsurface weld defects such as porosity, lack of fusion, and slag. Not performing the RT examinations increased the probability that such weld defects will remain in the repair.

The weld buildups and final repairs for the "A" and "B" Valves will restore the required minimum wall thickness. The primary damage mechanism in the repaired area is wear, and the presence of small cracks or weld defects such as porosity and slag would not significantly increase risk of structural failure of the repaired areas. The original wear is associated with an unusual plant operating condition, the lower plug guide is constructed of 316 stainless steel, and an anti-rotation device is to be welded into place, so additional wear of the repaired areas is not expected, and the licensee has performed wear rate calculations to demonstrate that the valve body is not expected to experience thinning due to wear below the minimum wall thickness for current licensed life of the facility. Therefore, the staff concludes that, given the nature of the subject repair, EVT is sufficient to provide reasonable assurance of the structural integrity of the repaired valves.

Furthermore, performing the required PT examinations would result in an additional radiological dose of 10.3 person-Rem and performing the required RT would result in an additional radiological dose of approximately 11.8 person-Rem. These doses are significant, and the staff finds that they represent a hardship to the licensee consistent with the provisions of 10 CFR 50.55a(z)(2).

Therefore, based on the above, the NRC staff finds that (1) there is reasonable assurance that the licensee's proposed alternative has a minimal impact on safety; and (2) the licensee's hardship justification is acceptable.

NRC Staff Conclusion read by Nancy Salgado, Branch Chief, Plant Licensing Branch III, Office of Nuclear Reactor Regulation

As Chief of the Plant Licensing Branch III, Office of Nuclear Reactor Regulation, I agree with the conclusions of the Piping and Head Penetrations Branch.

The NRC staff concludes that the proposed alternative I4R-12, Revision 2 to use EVT in lieu of PT and to not perform RT at LaSalle Unit 2 will provide reasonable assurance of adequate safety for the subject valve repairs. The NRC staff finds that complying with the inspection requirements of the ASME Code, Section III and ASME Code, Section XI, as mandated by 10 CFR 50.55a, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

Therefore, effective March 29, 2021, the NRC authorizes the use of the proposed alternative I4R-12, Revision 2 at LaSalle Unit 2 for the repairs of Valves 2B33-F060A and 2B33-F060B.

All other requirements in ASME Code, Section III and Section XI for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

This verbal authorization does not preclude the NRC staff from asking additional questions and clarifications regarding proposed alternative I4R-12, Revision 2 while preparing the subsequent written safety evaluation.

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